The CRUSHED STONE JOURNAL

In This Issue

- Tests on Stabilized Base Mixtures
- Labor Relations in Industry
- Increased Responsibilities and Functions of Trade Associations Under Modern Conditions
- Board Meeting to be held at White Sulphur Springs

May-June · 1937

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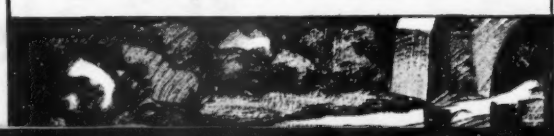
NATIONAL CRUSHED STONE ASSOCIATION



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The Crushed Stone Journal

Official Publication of the NATIONAL CRUSHED STONE ASSOCIATION

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Contents

Page

Tests on Stabilized Base Mixtures —A. T. Goldbeck - - - 3

Summary Reports of National Silicosis Conference Released - - - - - - 9

Labor Relations in Industry —Edward F. McGrady - - 10

Increased Responsibilities and Functions of Trade Associations Under Modern Conditions —Earl Constantine - - - 15

Executive Committee Selects White Sulphur Springs for Mid-Year Meeting of Board - 19

View of The Greenbrier, White Sulphur Springs, West Virginia, where the mid-summer meeting of the Board of Directors will be held on Thursday, June 17

THE
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Tests on Stabilized Base Mixtures

By A. T. GOLDBECK
Engineering Director, National Crushed Stone Association, Washington, D. C.

◆ Stabilized highway surfaces and bases have received much attention recently. In order to be prepared to offer advice on this subject, first-hand information is being obtained by the National Crushed Stone Association. Laboratory tests on stabilized mixtures are described in the present article and they show that stone screenings are highly meritorious for stabilized road construction.

DURING the past few years many miles of wearing surfaces and bases for highways have been built by the simple process of stabilizing the natural soil so as to render it capable of carrying traffic loads or by laying plant mixtures of low cost to which various "stabilizing" admixtures have been added for the purpose of making these surfaces or bases more or less continuously stable under different weather conditions. As stone screenings or quarry fines have excellent inherent properties for stabilization work, it would seem that stabilization should furnish a ready market for this product of the quarry.

Stabilization with low cost materials is not a new subject, for stabilization of soils has been practiced in one form or another for many years. The sand-clay and top-soil roads of the South are examples of more or less stabilized surfaces. In order to gain information of particular value in the use of stone screenings for this purpose, tests on stabilized mixtures have been undertaken in the laboratory of the National Crushed Stone Association and it is the purpose of the present article to describe the methods of test being used and to discuss some of the results obtained.

What Is a Stabilized Base or Road Surface?

Everyone is familiar with the fact that a clay soil becomes very soft in wet weather and is incapable of supporting even very light loads without deformation. By mixing with that clay some kind of granular material the load-supporting value of the clay is increased, especially if the adjacent particles of granular material are brought into contact with one another. When granular material is added to the clay, there results a mass of small size aggregate surrounded with films of clay which also fill the voids. The clay then acts as an adhesive and binds the aggregate particles together and also serves to keep out excess water. The use of more than enough clay to fill the voids in the aggregate spreads the particles and less stability results than when the voids are just filled and no more. Too little clay makes a pervious mass which allows water to penetrate and soften it. By the use of granular particles of the correct gradation, these voids can be reduced and still less clay is required in the mixture. Such a mixture is the simplest form of a stabilized road mixture.

The granular material aids in stabilizing the mass because it not only provides internal friction, but, also, because the particles interlock with one another and the internal movement of one particle with respect to another under load is rendered more difficult. Screenings, because of their roughness and angularity, provide exceptional stability when properly graded and properly mixed with the correct

amount of fine particles, whether of clay or of stone dust.

Still further stabilization of the mass is effected if, by some treatment, the clay can be made more effective as a cementing and water-proofing material. Various admixtures are advocated by different individuals for stabilization purposes. They include calcium chloride, $CaCl_2$, common salt, NaCl, asphaltic emulsion, tar, asphaltic cements in different forms and also portland cement.

It is important to the stone producer and to the user of stone screenings to know something about the properties of stabilized mixtures containing different admixed materials and it is of value, also, to know how various combinations of different fine particles influence the stability of the resulting mixtures.

Laboratory Studies of Stabilized Mixtures

Gradation of Mixture

In approaching a laboratory study of stabilized mixtures it was necessary to pioneer in virgin territory. Years ago in connection with a study of the density of concrete mixtures, W. B. Fuller developed that gradation of aggregate and cement which seemed to create the greatest obtainable density and he devised the so-called "Fuller Curve of Maximum Density."[1] As it seems reasonable that stabilized mixtures should also have the greatest possible density for maximum stability and maximum water tightness, this gradation curve was accepted as a starting point of the gradations to use in the present investigations. However, in order to be sure that this gradation curve is really meritorious for this particular purpose, it was decided to experiment with somewhat coarser and also somewhat finer mixtures.

In Fig. 1 is shown the Fuller curve of gradation for maximum density (Curve C), and so also are shown two curves of finer gradations (Curves A and B), and two of coarser gradation (Curves D and E).

Water Plays an Important Role

Again, reverting to knowledge gained with concrete mixtures, it has been determined that the quantity of mixing water greatly influences the degree of density which can be obtained with a granular mixture. In Bulletin 137 of the University of Illinois Engineering Experiment Station, Talbot and Richart have described a method for obtaining the amount of mixing water which will create maximum density in a portland cement mortar. A stabilized granular mixture is not unlike a portland cement mortar; the main difference is in the fact that the fine particles of clay or other materials now become the cementing medium. Consequently, the Talbot-Richart method for obtaining maximum density applies also to stabilized mixtures.

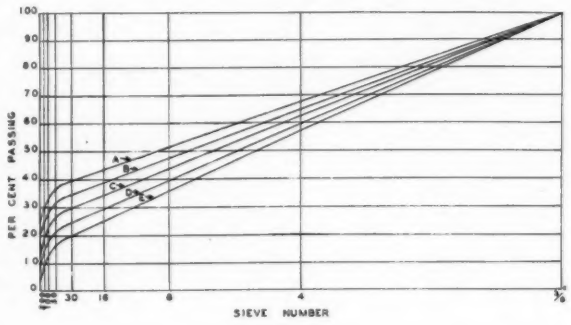

Figure 1.

Fuller's Gradation Curve of Maximum Density (Curve C) Showing Also Two Coarser (D and E) and Two Finer (A and B) Gradation Curves Used in Tests.

The apparatus used consists of a cylindrical brass container 2 in. in diameter and 4 in. high. The stabilized mixture is mixed with an assumed quantity of water, say 8 per cent by weight of the mixture, and the resulting mixture is then tamped into the cylinder, employing for this purpose a ¾ in. sq. wooden tamp. The mixture is placed into the container in three layers and each layer is tamped 25 times and finally the top is struck off level and the container and mixture are weighed and emptied back into the mixing pan. More water is added and the procedure of mixing and weighing is repeated. This same procedure may be repeated a half a dozen times or more. The mixture will show greater weight with each added amount of water until a percentage is reached which causes a decrease in weight. This occurs because the optimum water content for maximum density has now been reached; more water tends to spread the particles and this makes the mixture less dense. The optimum water content for maximum density determined in this way would seem to be the most favorable water content to use in practical construction in order to obtain the greatest compaction of the stabilized surface. This, however, is not always the most favorable water content to use with certain bituminous mixtures.

[1] See "Concrete, Plain and Reinforced," by F. W. Taylor and Sanford E. Thompson.

Shear Tests for Stability

As the stability or ability to carry loads depends largely upon the resistance to internal movement of the particles with respect to one another, the simplest form of stability test seems to be a test which will measure internal shearing resistance. In deciding upon the form of specimen and apparatus to use, it was considered desirable that the results be influenced, in so far as possible, only by the characteristics of the material itself without introducing other factors of unknown quantity. Consequently, a punching shear test was accepted as most nearly filling these requirements. In Fig. 2 is shown a view of the shear test apparatus.

Shear Test Apparatus

This apparatus is made up in part of sections of 4 in. diameter steel pipe cut to a length of 2⅝ inches. The stabilized mixture is first tamped into one of

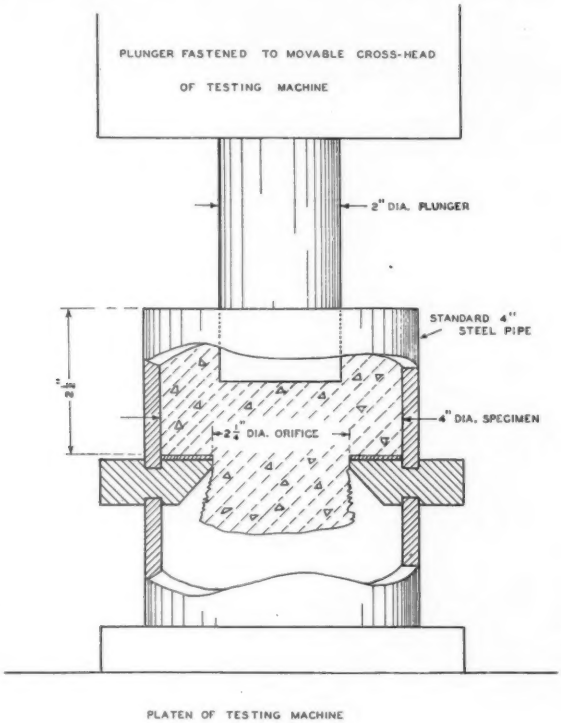

Figure 2.
Shear Test Apparatus.

these pipe sections in two layers and each layer is tamped with a steel tamp as shown in Fig. 3. This tamp is the same apparatus as used in A. S. T. M. Tentative Method of Test for Specific Gravity and Absorption of Fine Aggregate. It weighs 12 oz. and has a flat, circular tamping face 1 in. in diameter. One hundred firm strokes of the tamp about 4 in. in height are given to each layer. During molding the pipe mold is placed on a glass plate with a washer 1/16 in. thick in the bottom of the mold. The washer is made 4 in. in diameter to fit the mold and has a circular opening 2¼ in. in diameter.

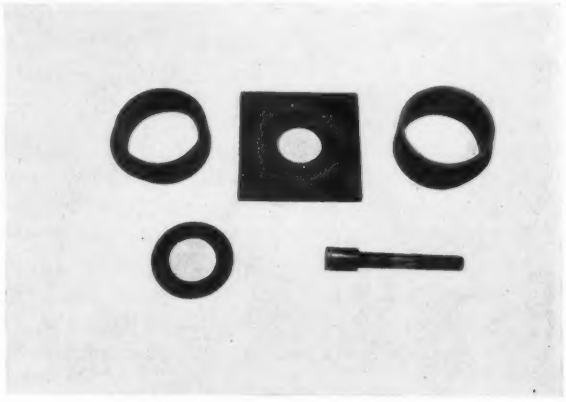

Figure 3.
Shear Test Apparatus and Tamping Tool.

After the specimen is cured, as later described, it is placed on an orifice plate grooved to fit the bottom of the pipe section. The plate in turn is supported by a similar pipe section fitting into a groove in the bottom of the orifice plate. The orifice in this plate is 2¼ in. in diameter.

Curing the Specimens

Stabilized mixtures, in general, vary in stability depending upon their moisture content. Even clay is capable of supporting very high pressure without deforming when it is dry but becomes more and more unstable as the moisture content rises. This same statement applies to stabilized mixtures. The stability of the mixture having low moisture content is, therefore, of no particular importance, but it is highly important to know something of its stability when it has absorbed that amount of water which it is likely to take up during unfavorably wet conditions. It should be further borne in mind that stabilized mixtures, originally containing water, will shrink upon drying out and this shrinkage produces higher density than existed when the mixture was first made. It is believed desirable to simulate these

drying and wetting service conditions in curing the laboratory specimens prior to testing them. Consequently, the following curing procedure has been adopted in treating stabilized mixture laboratory specimens.

After the specimens are formed, they are placed in a current of air produced by an electric fan. A duct 12 in. by 18 in. in cross-section through which the air is conveyed is useful for this purpose. Drying proceeds for three days, then the specimens are placed on a saturated subgrade for a period of 7 days so that they may take up water by capillarity. The saturated subgrade is merely a bed of sand contained in a large flat galvanized iron pan. A water bottle is inverted on this bed of sand so that the water rises just to the surface of the sand. Blotting paper is placed on the sand and the specimens are set on the blotting paper in their containing molds. The 4-inch washer is left in the bottom of the mold and the top of the mold is covered with wax paper held in place with a rubber band. Thus, evaporation from the specimen is prevented and this condition simulates that produced by a bituminous surface treatment on a stabilized base. Finally, at the end of 7 days wet curing, the specimen is ready for testing to determine its punching shear resistance which is assumed to be a measure of its stability.

Making the Shear Test

The set-up for making the shear test is shown in Fig. 4. The 2-inch diameter plunger is brought into

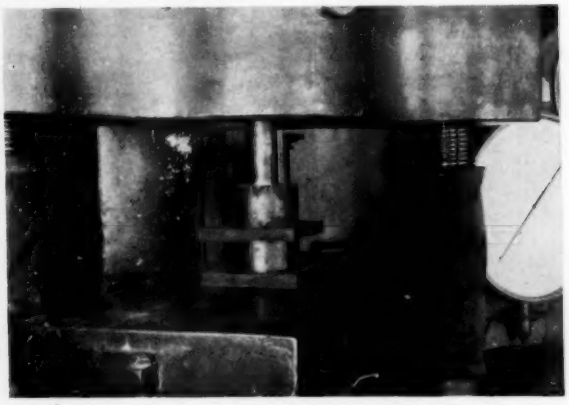

Figure 4.
Shear Apparatus Mounted in Testing Machine.

contact with the top of the specimen at the center and load is applied at the highest speed of the testing machine (one inch per minute). A Southwark-Emery hydraulic machine is used and load is continued until the indicating hand no longer advances. The maximum load obtained represents the total shearing resistance of the specimen. The effect of this test is to produce a cylindrical surface of rupture through the specimen approximately 2 in. in diameter. A view of one of the specimens after failure is shown in Fig. 5. The shearing resistance is expressed in terms of total load on the 2 inch diameter plunger.

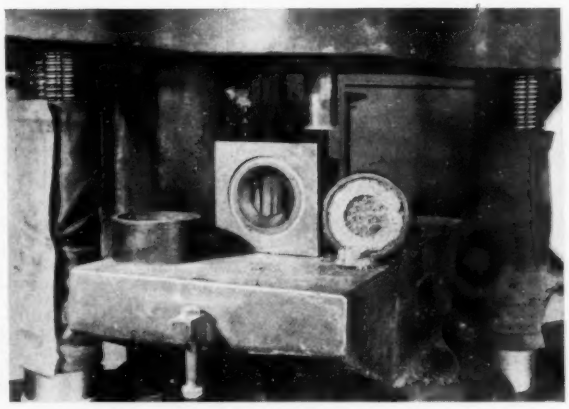

Figure 5.
Shear Specimen After Failure.

Absorption Tests

Immediately after the specimens are tested for stability the material is taken from the mold, placed in a pan and weighed. It is then dried in an oven for 24 hours at 220 F. and again weighed. The difference in weight is used to calculate the percentage of moisture contained by the specimen due to its contact with the wet subgrade.

No doubt shrinkage tests would also be important on those mixtures consisting largely of finely divided particles of clay and sand, but are not so important with screenings mixtures because of their low shrinkage. Small specimens consisting of cylinders one inch in diameter and one inch high, such as made in determining "cementing value" of rock dust, have also served a useful purpose in preliminary studies of absorption and slaking tendency. They have the advantage of permitting the rapid study of a large number of specimens made with a wide variety of mixtures.

Some Stability Results from Preliminary Studies

Such results of the stability tests as have been made up to date show some very interesting preliminary tendencies. Naturally, with so few data, definite conclusions should not be drawn but rather should the values given be taken as indicative of trends. These preliminary tests were made primarily to develop a standard procedure in testing and also to investigate the effects of different variables such as:

(a) Stabilizing admixtures
(b) Kind of granular material
(c) Effect of curing, etc.

In order to bring out the significance of the data thus far obtained, perhaps it will be well to present it in answer to several very natural questions.

1. *What is the effect of water content on stability?* To answer this question mixtures were made up in two series, one containing limestone throughout, including the fine particles and a second was made of gravel, sand and clay. Both series were graded as follows (Gradation C of Fig. 1):

Sieve No.	*Per cent Retained*
4	37
8	56
16	66
30	70
50	74
100	78
200	81

Shear specimens were made as previously described using 9.6 per cent of water with the stone mixtures and 10.4 per cent with the gravel-sand-clay mixtures. These water contents produced maximum density in the respective mixtures. The specimens were then allowed to dry in a current of air for 1, 5, 8 and 30 hours to produce a range in moisture content and tests were made at these periods. Also, other specimens previously dried for 30 hours were placed on the wet subgrade for 24 hours and were then tested with the results shown in Table I.

The Plastic Index[1] value for that portion of the samples finer than the No. 40 sieve was 0 to 1 for the stone screenings and 3 to 6 for the gravel-sand-clay mixture. These values are well within the values ordinarily considered suitable for stabilized mixtures.

[1] Note: For a definition of "Plastic Index" and its method of determination see Proceedings of the American Society for Testing Materials for 1935, Part I, page 970.

TABLE I

EFFECT OF WATER CONTENT ON STABILITY OF TWO DIFFERENT MIXTURES

Treatment of Sample	Crushed Limestone		Gravel-Sand-Clay Mixtures	
	% Moisture	Stability (lb.)	% Moisture	Stability (lb.)
Dried for 1 hr. in air	8.1	4470	9.1	240
" " 5 " " "	5.9	5980	6.0	2410
" " 8 " " "	5.3	6650	5.2	4120
" " 30 " " "	1.1	10870	2.7	7020
" " 30 " " " then placed for 24 hrs. on wet subgrade	6.2	5920	6.7	2480

The above table shows definitely the effect of water in decreasing the stability; also, it is indicated that the crushed limestone mixture has relatively high stability in spite of high water content while the gravel-sand-clay mixture may have very low stability.

2. *What is the effect of a coarser gradation?* The same materials as above were made up with a coarser gradation as follows: This is Gradation E in Fig. 1.

Sieve No.	*Per cent Retained*
4	43
8	64
16	75
30	80
50	84
100	87
200	89

Again tests were made as before at different drying periods.

TABLE II

STABILITY RESULTS ON TWO DIFFERENT MIXTURES OF COARSER GRADATION THAN IN TABLE I
(Gradation E of Fig. 1)

Treatment of Sample	Crushed Limestone		Gravel-Sand-Clay Mixtures	
	% Moisture	Stability (lb.)	% Moisture	Stability (lb.)
Dried for 1 hr. in air	7.9	4640	9.0	1160
" " 5 " " "	4.7	5689	6.5	2970
" " 8 " " "	2.9	6100	4.5	4910
" " 30 " " "	0.7	6610	1.9	9160
" " 30 " " " then 24 hr. on wet subgrade	6.1	4830	7.4	2210

Again, the drying out has increased the stability of both mixtures, and upon taking up water from the wet subgrade, there is a reduction in stability. This

reduction is quite large in the case of the gravel-sand-clay mixtures. Comparing the values in Table II with those in Table I, it is evident that there has been a small reduction in stability in the stone screenings and also in the gravel-sand-clay mixture when subjected to wet subgrade conditions.

3. *What is the effect of different stabilizing admixtures on stability?* Using the same gradation and materials as in Table I, the following are typical of results thus far obtained. They should not be taken as conclusive, but merely as indicative of trends.

TABLE III

EFFECT OF STABILIZING MATERIALS ON MOISTURE CONTENT AND STABILITY

Treatment of Sample	Crushed Limestone		Gravel-Sand-Clay Mixtures	
	% Moisture	Stability (lb.)	% Moisture	Stability (lb.)
Dried for 1 hr. in air	8.1	4470	9.1	240
" " 5 " " "	5.9	5980	6.0	2410
" " 8 " " "	5.3	6650	5.2	4120
" " 30 " " "	1.1	10870	2.7	7020
" " 30 " " " then on wet subgrade for 24 hr.	6.2	5920	6.7	2480
0.75% Salt—Sodium Chloride				
Dried for 1 hr. in air	7.8	4720	9.4	100
" " 5 " " "	7.3	4520	8.6	470
" " 8 " " "	6.8	4080	7.7	630
" " 30 " " "	5.1	6830	6.2	2440
" " 30 " " " then on wet subgrade for 24 hr.	8.1	4830	8.4	420
0.75% Calcium Chloride				
Dried for 1 hr. in air	8.0	4430	9.6	60
" " 5 " " "	7.6	4440	8.3	380
" " 8 " " "	6.8	4710	7.7	760
" " 30 " " "	5.0	6320	5.0	3810
" " 30 " " " then on wet subgrade for 24 hr.	7.7	4780	8.2	530

Evidently both salt and calcium chloride tend to retain more water in the mixture than is retained in the plain mixtures and, consequently, their stability values are lower. Also, this particular gravel-sand-clay mixture was very greatly affected in stability while the screenings mixture was not affected to an important extent. It is not known whether these results are typical of the behavior of all crushed stone mixtures as contrasted with gravel-sand-clay mixtures. If so, relatively, there would seem to be a very high safety factor in the screenings mixture, for even when subjected to an excessively wet condition, the screenings mixture remained stable.

It is not as yet known what significance the stability values shown in Table III have in relation to service behavior. This can be established only by a proper correlation of laboratory and field results. The above results should not be interpreted as disparaging the general value of salt or calcium chloride for stabilization purposes, but rather to indicate their possible effect on these mixtures during those seasons producing high moisture content.

Action of Mixtures Stabilized with Asphaltic Emulsion

To obtain some preliminary indications regarding the action of mixtures stabilized with asphaltic emulsion, the same aggregates, limestone screenings and also gravel-sand-clay mixtures, and the same gradation (Gradation C) were employed as in the first series whose results are shown in Table I.

Stability specimens were made as before described, each with 3 per cent by weight of asphaltic emulsion used for stabilization purposes. The stone mixes contained 9.6 per cent of water and the gravel-sand-clay mixes 10.4 per cent. These respective percentages of water were based on determinations for maximum density. Mixtures stabilized with emulsions must dry out to some extent before they attain maximum stability and before they will become water-proof.

To study the effect of moisture retained in the mixtures, the specimens were allowed to cure for different periods in the air and were then placed on a saturated subgrade for 168 hours. The results of these tests in detail are shown in Table IV.

TABLE IV

STABILITY OF MIXTURES CONTAINING 3 PER CENT ASPHALTIC EMULSION

Designation	Treatment of Sample, Hrs.		Crushed Limestone		Gravel-Sand-Clay Mixtures	
	Air Dried	On Wet Subgrade	% Moisture	Stability (lb.)	% Moisture	Stability (lb.)
1	24	168	7.0	5740	7.7	1105
2	48	168	6.6	5880	5.2	2270
3	72	168	5.6	7150	3.5	3770
4	240	0	0.18	9620	0.48	6040

To more clearly show the results in the above table they were plotted in Fig. 6.

It is evident that if there is still considerable water in emulsion mixes, they are not as stable as when allowed to dry out. The screenings, however, seem quite stable even with only 24 hours drying before curing on a wet subgrade. The more thoroughly these mixes were cured, the more effectively they resisted subsequent absorption and, consequently, the more stable they became. A very interesting feature of these results is the extremely high stabil-

ity attained by the screenings mixtures. For the particular mixtures tested, the screenings gave practically as high stability in their wettest and least stable condition as the gravel-sand-clay mixtures in their driest and most stable condition. Evidently, if these results are typical of what to expect of the stability of screenings mixtures, they seem to be exceptionally well-suited for use in stabilized mixtures.

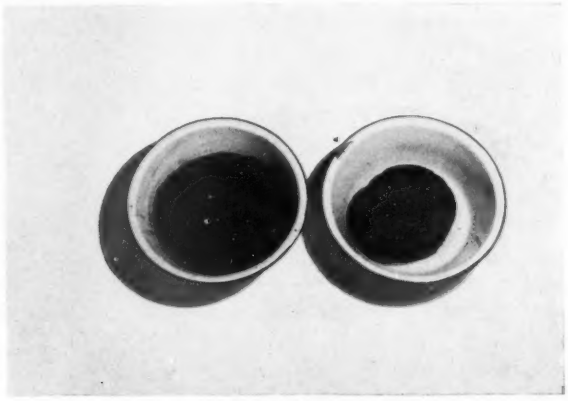

FIGURE 6.

WATER-PROOFING EFFECT OF BITUMINOUS MATERIAL ON STABILIZED MIXTURE. UNTREATED SPECIMEN SLAKES IN WATER; THE TREATED SPECIMEN UNAFFECTED AFTER IMMERSION FOR ONE MONTH.

Conclusion

Let it be emphasized, that the above described results are given primarily to illustrate the methods of test now being used in the National Crushed Stone Association laboratory for studying stabilized mixtures. They are not intended to and do not prove any material to be unsuited for stabilization work. They do show outstanding differences in results, but the significance of these results must be correlated with observations of mixtures in service before it can be stated definitely that a mixture to be satisfactory must have any specified stability value. The test results thus far obtained indicate rather striking stability values in stone screenings mixtures. This is so irrespective of the "stabilizing" admixture used and irrespective of the condition of moisture of the subgrade. Hence, screenings would seem to provide an exceptionally high safety factor against failure under conditions of high moisture content. General observations of service behavior of screenings stabilized bases bear out the indications of these laboratory tests very well indeed.

Summary Reports of National Silicosis Conference Released

AFTER months of intense study and research conducted by experts in their respective fields, there are now available to the public in summary form the findings of the various standing committees created by the National Silicosis Conference. This material has been released by the Division of Labor Standards of the United States Department of Labor and is identified as Bulletin No. 13. The developments which led to the preparation of these reports are set forth in the introduction from which we quote in part as follows:

"During the past few years so many conflicting statements have been made about the subject of silicosis that many persons have become confused. They do not know what to believe or what to do. Alarmed workers have filed claims against their employers, sometimes unjustly. Apprehensive employers and insurance carriers in some cases have adopted employment and underwriting policies that have reacted unfavorably both against themselves and the workers. A few incompetent attorneys and physicians, particularly in court cases, have further complicated the situation, so that today a condition exists that fully deserves thoughtful consideration and some definite declarations by those who are competent to speak."

The First National Silicosis Conference, attended by more than three hundred persons, was held on invitation of the Secretary of Labor on April 14, 1936. Four committees were established as follows:

1. Committee on the Prevention of Silicosis through Medical Control.
2. Committee on the Prevention of Silicosis through Engineering Control.
3. Committee on the Economic, Legal and Insurance Phases of the Silicosis Problem.
4. Committee on the Regulatory and Administrative Phases of the Silicosis Problem.

These committees held numerous meetings and their reports were submitted to the Second National Silicosis Conference on February 3, 1937.

We believe that the material in this publication should prove of invaluable assistance in connection with the development of legislation or regulation in the various states, now receiving such universal attention. We shall be glad to forward copies of the bulletin to member companies upon request.

Labor Relations in Industry[1]

By HON. EDWARD F. McGRADY

Assistant Secretary of Labor
Washington, D. C.

◆ The Supreme Court's decision validating the Wagner Labor Relations Act has created an entirely new conception of the relation between labor and management under the supervision of Government. Mr. McGrady, in view of his extensive experience in the field of labor relations, is outstandingly well qualified to discuss this highly important subject and we earnestly suggest that his article be given a thoughtful reading.

THIS may be one of the most important meetings of this distinguished Chamber. I understand that you are to consider, among other things, labor relations in view of a recent judicial revolution in the law governing them. We do not know, as yet, the full intendment of the Supreme Court decision on the Wagner Labor Act. Before this decision, most lawyers thought that the Court construed the constitution to prohibit Federal regulation of labor relations on the ground that it infringed the due process clause of the 14th Amendment. This created the famous "No-Man's Land" between the power of the State and the power of the Nation in which no governmental authority could, by statute, regulate many of the most important relations between employer and employee.

Precisely how much these two far-reaching decisions may have changed all that, we do not know. But that they have changed it importantly all legal authorities seem to agree. If you admit the broad principles stated in these two cases, it is not easy to doubt that they have given us a completely new basis for the relationship between labor and management under supervision of government. "No-Man's Land" is completely occupied.

Labor is principally interested in two aspects of this problem. First, it regards the right of collective bargaining through representatives of its own choosing independent of employer influence as absolutely necessary in this modern age. Secondly, it believes that there should be some floor under labor relations which will protect labor against sudden and destructive downswings in wages and lengthening of hours to the unemployment and distress of millions, such as were witnessed during the depression. These two aims seem now within the range of accomplishment.

Labor believes that collective bargaining is necessary because it thinks that under modern conditions in industry there must be either collective bargaining or no bargaining at all. The rapidity and the volume of concentration of American industry into great corporate groupings that has gone on in this century, have been astonishing. I know the difference of opinion over the precise figures which show the tremendous percentages of business in various economic fields that are controlled by a very few large corporations. It is unnecessary to enter that debate. It is enough to say that we all well know that the old era, in which every employer was in personal contact with his workers, knew their problems, and actually did bargain with them for their services, is completely gone. We know that the owners of these great corporate units—the stockholders—have no contact whatever with their tens of thousands and hundreds of thousands of workers. We know that each one of these employers is itself a vast collectivism. We know that the managements of them are representatives chosen freely by these collectivisms and that on the employer's side we do have collective bargaining conducted by representatives of the employer's own choosing. Common sense would seem to say that if there is to be any mutuality in this relationship, labor also must move as a collectivism and must bargain through its own chosen representatives—just as the employer does.

Against this view some great employers have insisted, at least until recently, that they will never negotiate with representatives of their men, or in any way except individually—"man to man." In view of the facts which I have related and which you know as well as I do—and as every informed person does—the idea that there is any such thing as individual bargaining in modern industrial circumstances is just not true.

Unless labor, grouped collectively, can have its expert representatives wholly independent of employer influence, speak for it with a powerful voice, there is no real bargaining at all and wage rates are only an arbitrary decree of a more or less beneficent despotism fixing the conditions of labor in its own untrammelled discretion.

[1] Presented at the 25th Annual Meeting of the Chamber of Commerce of the United States, April 26-29, 1937, Washington, D. C.

It won't do. I know you recognize that it won't do. The whole world recognizes it. The principles I have discussed have been adopted in every important industrial nation and put in practice to a far greater extent than they have ever been practiced here. Yet we have progressed far since the days in the early part of this century when it was a crime for workers even to meet in their own interest or to take any collective action whatever. These conditions and the public opinion attending them have changed because the whole circumstance of our economic life has changed. Collective bargaining has become such an obvious necessity to human justice in this modern world of vast industrial collectivism that any general denial of it here could not have gone on much longer without explosive and very dangerous results.

It has been a long time since I have heard any very clear denial of the principles I have just stated. Most economists, publicists, and farsighted industrialists that I know have advanced these principles in more or less different words, but to practically the same effect. If there were any question about that, I could recall to your memory the fact that when the President, in 1933, asked employers voluntarily to agree with him on a labor policy in the so-called P. R. A. (President's Reemployment Agreement), by actual census count 97½ per cent of the employers of this country signed that agreement. It contained a specific pledge to permit to labor the right of collective bargaining through representatives of its own choosing, selected without employer influence or domination of any kind.

You and I know that these great changes from ancient methods of thought and practice do not come so easily in our hearts. We all dedicated ourselves to this principle in the letter four years ago, but it is the letter that killeth. It is the spirit that giveth light. I do not wish to appear harsh in judgment, but the cold, historical fact is that the four years since the promise was made, were largely spent by some employers in efforts to frustrate, avoid, nullify or escape fulfillment of the spirit of that pledge. I am not saying that many of these attempts were not sincerely believed by those who made them, to be in substantial compliance with the statute that had been written and with the promise that had been passed. There was too much legalism and too many lawyers in the advice that some received.

I know too that the device of the company union spread like wildfire over this country that it might be accepted as compliance with the provisions of paragraph 7a of the National Industrial Recovery Act, and many honest men believed that. But I also know that in practice, in almost every case, the company union did not give labor the independent collective and representative voice that it must have to meet the necessities adequately. By "company union," I mean a union confined to a single company, more or less supported by management, and, above all, offering as representatives for labor only employees of that company.

As long as the so-called representatives of labor, for the purpose of collective bargaining, also maintain the relations of employee to the employer, labor cannot expect to be represented fearlessly. Fear of the boss and apprehension of the job is an indelible intangible that ruins true representation. There is something of the old "master and servant" relationship that does not easily down. It has been fairly tried and it doesn't work.

We have wasted four years running up these blind alleys. Section 7a went out with no particular condemnation by the Court—it just fell in the general ruin of the Schechter case. That left the whole matter in such a shadow of judicial doubt that I don't blame any employer for uncertainty as to what his duty under the law might be, or as to what attitude he should take on this vexed question. But that is all water over the dam. We are no longer under the shadow of that doubt. It is now very clear at least that employees of a company in circumstances where their labor relations within one State "affect or concern" other states, *do* have the right of collective bargaining and of independent representation, and that the Federal Government is empowered to enforce that right.

On that assumption, I beg to discuss this subject. The attitudes already taken by some of our greatest industrial leaders seem to make it clear that, on both sides, we are now ready to face the new day seeing eye-to-eye on this question. The greatest mistake that I believe any employer could make is again to call in the lawyers and attempt to try to frustrate, avoid or nullify this right. I have no doubt that no such thought is in the minds of the responsible representatives of our industrialists gathered here.

We are all industrialists—labor as well as management. It is nonsense to suppose that labor has not as much interest in the success of our joint enterprise in every one of these great corporations as have the management, the directorate, or the stockholders.

The task for us who are partners in this economic adventure is to sit down together across the table, to look the circumstances of this real New Deal for labor in the face in common council, with proper restraints and unfailing courtesy, to work out an adaptation and a solution which, while rendering the greatest possible benefit to each, will do the least possible harm to any.

That can be done. It can be done without acrimony, violence, unfairness, improper advantage or any of the little tricks that each side in any ancient hostility seem to expect in any encounter with the other. We can adjourn all that and play the game in the honesty of purpose and good sportsmanship that we like to think have distinguished American relations from the beginning of our history.

As a starter, let me say frankly that I know many of you gentlemen are impressed with a belief that the Wagner Labor Act is unfair to industry because while it creates duties and obligations on the part of management it creates no rights on their part, and while it creates so many rights for labor, it seems to create no duties and obligations for labor.

Let us not forget that at the time the Wagner Act was written the attitude of at least some management, as to the particular subjects it addressed, seemed to be that, while there were plenty of duties on the part of labor, and rights on the part of management, the reverse of that did not exist. In other words, the Wagner Act invaded a field so one-sided in its practical application that its principal concern was to strike a new balance and rectify a condition unfair on the other side. Perhaps this whole background has now been changed, but in these great fundamental changes we must remember that Rome wasn't built in a day.

There has been no real experience with the Wagner Act and that, permit me to say, was not the fault of labor. It was the fault of some of management and the lower courts. In almost every conceivable circumstance, the lawyers moved in on that law with a result that the ink on it was scarcely dry before the National Labor Relations Board was paralyzed by injunction on practically every front. It remained paralyzed until by the recent decision of the Supreme Court in the Jones & Laughlin, Associated Press and other related cases, it was restored to the potency with which Congress had baptized it. Let's get a little experience with the new dispensation before we begin to write new laws.

The essence of successful labor relations is an unvarying respect for the sanctity of contracts. Labor knows that it can expect no countenance in public opinion unless it respects its contracts, and it knows further that without the respect of public opinion it cannot live.

Before a decision is reached by management to demand the incorporation of labor units, and statutory fixation of pains and penalties, it might be well to examine the record of labor relations in some of the older and better established units—for example—the relations in the Bituminous Coal Industry, the Garment Industry, and the Printing Trades. You will find there stability, respect for contracts and comparative peace.

It happens now that the veil of the temple of labor is rent asunder by fratricidal strife, but if you will examine the records of the principal leaders on both sides of that unfortunate rift you will find, I think, an invariable history of absolute adherence to the pledged word.

When new unions are formed with such rapidity as we have witnessed in the past few months, it is inevitable—especially when they feel that the law of the land is being violated on the other side—that new and inexperienced leaders will permit themselves hasty action.

Growing responsibility is the greatest disciplinarian of new labor leaders and when overhead control is so closely held by such experienced, responsible and dependable men as William Green on the one side, and John L. Lewis on the other, I think it would be the part of wisdom patiently to rely a little on that leadership for at least a reasonable period of seasoning and experience.

I do not for a moment condone or contend for any irresponsibility on the part of labor, but I do not jump from that principle to the immediate conclusion that some new statutory action is the way to complete responsibility. God knows that these leaders have a responsibility far heavier than any law could lay upon them. They have the responsibility for the life and limb—for the peace and welfare of their constituents. They have also and I know they feel deeply, the responsibility of any American in a powerful position, whether in or out of government, for the peace and welfare of the people of the United States.

As John Lewis is reported to have said to a friend: "Sure, some of our new leaders are inexperienced, but is the answer of industry that because they are inexperienced they are never going to be allowed a

chance to get experience? Is labor to be forestalled forever because it has no chance to practice these relations? If the Government in an emergency had to raise an army of several million men, would you expect all the non-commissioned officers to be capable on the day after their enlistment?"

It will be pretty hard to find an answer to that intensely practical argument.

I can assure you of one thing. Labor approaches its new power with a due sense of its obligations. Labor does not seek trouble. You won't get arbitrary attitudes, unreasonableness, violence or hostility from labor, except in the measure that you mete it out. I know from personal contact. These men respect and admire you too much to start in that atmosphere and frame of mind.

If we can now just get rid of all old standoffishness —the old throw-back to the medieval concept of the master-and-servant relation—to the sense of partnership in a common purpose and on equal terms, you won't find your friends in labor at the conference table one bit more hard-boiled, one bit more voracious in bargaining, than you know your own selves to be when you sit down with either your supplier or your customer to trade out an ordinary business proposition in the ordinary peaceful struggle of competition.

I started out as an apprentice mechanic. I went forward through all the grades of foreman, superintendent, manager—top sergeant stuff to the captain of industry. I went from that to officer in a labor organization, finally to be a contact man for many years between labor and the Congress. Latterly, as a representative of government, I have been called in many times in some of the fiercest industrial disputes this country has known recently. In that process I came to know all of the great labor leaders, and it was my privilege also to become what I flatter myself is a confidant and friend of some of the greatest industrial leaders in this country, which is to say, the greatest industrial and labor leaders in the whole world.

I mention this little history merely to remark that from that rather full experience I conclude that there is no great difference between the humanity, the goodfellowship, the reasonableness and the sense of public and personal responsibility of the leaders on both sides of this argument—which in my opinion should be no argument at all.

The principal trouble is that they don't know each other well enough. In the early days in N. R. A., we almost accomplished the miracle of breaking down these barriers. I think one of the greatest mistakes of N. R. A. was that, after about six months of close contact between the Labor and Industrial Boards, most of the leaders of the original Industrial Board were "rotated out." It is true that men of equal caliber came in, but they had to be educated all over again. In the meantime a great opportunity was lost.

Contact, fellowship, the opportunity to learn and weigh and appraise the other fellow's problems is the way to a solution of these difficulties.

The simple fact has been impressed upon me over and over again in my work in attempting to mediate disputes in several of these great national industries. There is a sort of hierarchy in the management of a great corporation. The local plant manager has responsibility to the general manager who is sometimes a thousand miles away. In these tremendous business organizations the local manager is in a form of competition with other plant managers. He is very far away—in distance and contact—from the authorities who finally decide the labor policies which are of the most vital importance to the people who work. If his cost sheets, by reason of some concessions to local conditions, show a rising tendency when those of other local managers do not, his very job may be in question. His own subordinates—foremen and superintendents are not very eager bearers of bad tidings and if there are no other representatives of workers there is a tendency for him not to be informed of conditions developing under his hands which some day suddenly and sometimes to his complete surprise burst forth in an eruption, the end of which may be a loss of millions to both management and labor.

Now if in the new relationship we can work out some closer, warmer, more intimate contacts through this system of representation and collective bargaining many of the causes of friction, hostility and uncertainty can be stopped in their inception and the way is open to more peaceful days everywhere.

That can't be done by labor alone. It can't be done by management alone. It can be done only by the closest possible relationship accompanied by the utmost frankness from the top to the bottom.

I know that some of you approach this change with apprehension, but my studies and experience on the whole subject indicate a result which, I think, you will one day live to bless.

There is now rendered possible labor agreements covering whole industries and taking out of the field of competition, by the constituent companies in an industry, the whole question of labor costs. The possibilities of this change are very great. They are of such far-reaching public importance that I believe the original conception of N. R. A., in so far as it covered labor relations, will one day vindicate itself.

Advantages to both labor and management from this new partnership will prove so great that in its own protection the public also, through government, will some day have to have a seat at this partnership table—not to dictate, not to prohibit reasonable profit and improved labor conditions, but to protect the public from too great a use of the tremendous power of the new partnership.

I have been informed, I trust inaccurately, that in some industries there is a move to devise some way to restrict the spread of unionization in industry, to minimize the gain to labor in the Wagner Act, and in the recent Supreme Court decisions. I hope, if such a thing is true that you will use your great influence against it. Regardless of what you may think of other aspects of the New Deal, this march of labor to its minimum necessary objectives is the sweep of a great popular movement that covers the earth. You can no more stop it than Canute could have stopped the tides by his command, or attempted to sweep them back with a whiskbroom. No, it can't be stopped, but you can guide it, accommodate it to your needs and profit by it. My word to you in the most sympathetic, friendly and constructive counsel, is not to try to stop it but to use it and make it successful.

With the full cooperation of industry and labor, each trying to understand the problems of the other, we can work out our own destiny in our own way. All of us, industry, labor and the general public, will profit by such a program.

Arthur S. Lane Retires as Treasurer of John S. Lane & Son, Inc.

ROUNDING out a business career extending well over fifty years, during forty-six of which he has been prominently identified with the crushed stone industry, Arthur S. Lane has announced his resignation as Treasurer of John S. Lane and Son, Inc., and the Lane Construction Co. We believe Mr. Lane's many friends throughout the industry will be especially interested in the following article which we are reprinting through the courtesy of the "Meriden Record."

"After fifty-seven years' service, forty-six of which have been with the Lane Construction corporation and John S. Lane & Son, Inc., and their predecessors, Arthur S. Lane, treasurer of both companies, has decided to relinquish the duties and responsibilities which he has carried so long. The business conducted by the companies was founded by John S. Lane in 1890.

"Arthur S. Lane, eldest son of the founder, entered into the business with his father the following year as junior partner in the firm of John S. Lane & Son, then operating trap rock quarries in Meriden and building macadam highways.

"In 1902 the Lane Construction corporation was formed to take over the road building branch of the firm, and to enlarge the contracting portion of the business.

"In the same year the Meriden Quarries were absorbed by Connecticut Quarries, Inc., and Mr. Lane became treasurer of both companies.

"In 1904 the old firm was still operating quarries in Westfield, Mass., West Springfield, Mass., and Amherst, Mass., and the corporation of John S. Lane & Son, Inc., was formed to take over the remaining business of the old firm, and Mr. Lane was elected its treasurer.

"Today the Lane Construction company is probably the largest road-building outfit in the East, and the combined capital of the two companies is over one and a half million dollars.

"Mr. Lane will continue as Vice-President of both companies."

For a number of years Mr. Lane has actively participated in the activities of the National Crushed Stone Association, now serving as a member of its Board of Directors and in the capacity of Eastern Regional Vice-President. As he will continue as Vice-President of both companies, we anticipate his active interest in Association affairs for many years.

A sentiment we know is enthusiastically shared by his many friends throughout the industry was expressed to Mr. Lane when President Henry Rodes, upon learning of his retirement, wrote him as follows:

"I sincerely hope that this means you have decided to take things a little easier and build up your physical health to a point where you may continue to be of the same value to your friends that you have always been."

Increased Responsibilities and Functions of Trade Associations Under Modern Conditions[1]

By EARL CONSTANTINE

Managing Director, National Association of Hosiery Manufacturers, New York City

IT IS not my intention to present an exhaustive treatise on the broad subject which has been assigned to me. Rather, it is my hope to present some facts and express a few thoughts of a character which will stimulate earnest and fruitful discussion, out of which we may all profit.

Trade associations are facing today enlarged powers and responsibilities. The growing interrelations within our industries demand an increasing use of the instrumentalities set up by industry for dealing with industry-wide problems. I am sure that my listeners, and my confrères generally, will subscribe to these thoughts, and to the conviction that one of the inescapable consequences of industry regulation by law is wider and more frequent use of the facilities of a trade association.

Before considering the policies and methods which must be pursued by trade associations in the discharge of their newer and larger responsibilities, it is desirable to point out some of the developments of recent years, and even of recent months, which have contributed and are contributing to a broadening of the duties of trade associations and a consequent enlargement of the position and influence of such bodies within their respective industries.

Factors in Broader Association Responsibilities

At the outset I quote from my Annual Remarks to the hosiery industry, delivered a few days ago:

"Prior to 1935, restraints and regulation of industry by the Federal Government confined themselves chiefly to the fields of transportation and utilities. Beyond these we had the anti-trust laws to prevent monopoly and restraint of trade, the Pure Food Act to protect health, and the Federal Trade Act to assure fair play in the market. In the main, the operations of manufacturing industries were free and unregulated, particularly as regards labor relations.

"During the past four years the Federal Government has embarked on a course which increasingly involves the regulation of the conduct of manufacturing industries. While this policy or program is new and revolutionary to American industry, it must be noted that it is commonplace to one degree or another in the older industrial countries of Continental Europe, and even in England. Having encompassed our farthest frontiers and completed our pioneering, our industrial development resembles more and more the developments in the other established industrial countries.

"Industry is by nature a competitive undertaking. American manufacturing depends primarily on its domestic markets. Our multiplicity of industrial enterprises, and the large productive capacity which we possess, naturally make competition keener and keener as time goes on. As this development takes place, there is increasing need for clearly-defined rules to assure fair play and to permit new enterprises to develop on the basis of their ability. It is these facts that account in part for some of the new trends in legislation.

"The two major cost items in the manufacture of a product are commodities and labor. Generally speaking, the manufacturer has no control over the former, and is compelled to purchase them at the prevailing prices. However, the manufacturer has been free to offer employment at such rates, or on such basis, as he has felt able to pay. The result of this has been that wage rates and wage earnings have fluctuated considerably according to whether labor has been plentiful or scarce, business has been good or bad, competition has been keen or not. At times, prevailing wages and earnings have been uneconomically high, while at other times they have dipped toward unsocial levels. Some industries have been able to avoid wide variations. Society, as represented by the legislative branch of our government, has proceeded during the last four years to legislate in the field of labor relations. It proposes to set deadlines

[1] Presented at the Semi-Annual Meeting of the American Trade Association Executives, held during the Twenty-Fifth Annual Meeting of the Chamber of Commerce of the United States, Washington, D. C., April 26-29, 1937.

for wages below which industry may not go, and maximum working hours beyond which it may not operate.

"The briefest reference to the tendencies toward even limited regulation of manufacturing enterprises should be sufficient to make clear the fact that all industries have to deal increasingly with industry-wide problems, and that such problems can only be handled through the cooperative joint efforts of the members of an industry. An intra-plant management problem is one for the individual management to deal with in such manner as its best judgment dictates. On such problems a trade association can be useful by furnishing facts or by making available the known experience or methods of other manufacturers. When, however, management is dealing with a problem which reaches beyond its own operations and is common to the other members of the industry, whether as the result of legislation governing it or because by its very nature it is industry-wide, then obviously the problem can be dealt with only through a common instrument or a coordinating vehicle, such as a trade association.

"Management problems of the latter class are increasing in number and complexity, with the result that the functions and responsibilities of trade associations are growing with astounding rapidity, and such bodies are taking on new importance in the conduct of industry.

"A trade association, which is today keeping step with the times, is a vastly different organization from anything it may have been five or ten years ago. Trade association management today requires the best of business ability and judgment, and the large variety of problems with which such a body has to deal calls for a high degree of adaptability as well as application."

Commerce Definitions Expanded

Very recent decisions of the supreme tribunal of the land have broadened the definition of commerce in the light of the developments of time, and have opened new scopes for national industrial legislation. These decisions reflect the growing degree to which state lines or any other geographical lines within our country have vanished in the transaction of commerce. They take note of the growing number of corporations whose operations are not carried on in one plant and in one locality, but in many plants scattered in many localities and frequently at wide distances. Such expansions on the part of corporations may furnish them operating and marketing advantages, but on the other hand they involve them in wider and more varied problems of legislation, labor, and public relations. Whenever a corporation is dealing with a situation which involves one or more other companies within its own industry, wisdom suggests the need for interchange of views, conference, and if possible, common policy. Every such situation is in essence one in which a trade association can be used to advantage because it can participate as a joint and impartial agent.

As time goes on the number of both Federal and state administrative bodies increases. Their birth rate is high; their mortality record is scant. Through such bodies administrative law is increasing. The policies and the regulations which such bodies are developing must not only be studied and recorded, but their development must be influenced by intelligent and sound advice at open hearings or through all other proper channels. Certainly here is another task which can only be performed by an industrial agency acting for all, and properly staffed for the discharge of its functions.

Management-Labor Relations Most Important

The problem of the relations between management and labor is, of course, both the most important and the most difficult with which to deal. To a great extent in the past national and local trade associations regarded this problem as being without their scope. The opinion was quite generally expressed that the problem can be dealt with more understandingly by the local community where it happens to exist at the time, and past conditions lent much support to this viewpoint. However, as the marshalling and the handling of labor by its leaders becomes inter-community, and even industry-wide, obviously management will be compelled to similarly deal with the problem in terms of broader territory. To fail to do this would mean to leave one section of an industry to be played against another section, thus pyramiding one labor gain upon another until the whole industry finds itself saddled with a situation difficult, if not impossible, to deal with.

Of course, I am not suggesting even remotely opposition to legitimate gains on the part of labor and to improved conditions for labor. It is both natural and right that our labor should aspire to better conditions and larger returns, and management generally recognizes this fact and is sympathetic with such

aspirations and efforts. I am referring to the fact that the organization efforts of labor involve strategy and tactics, and that these must be met by management with wise and sound strategy and tactics. It is only out of such approach by both sides that we can assure results which are fair and which will not burden society unduly. The time has come when trade associations must play a part in the labor problem, at least to the extent of furnishing the means of communication and conference between members, groups, or sections of their industries. In some instances it will be the privilege of an association to devise plans and furnish leadership for their execution. As time goes on this will be increasingly true.

Trends Must be Studied and Interpreted

Until more recent years a trade association was looked upon frequently as being chiefly a clearing house of information for its industry, to be made available when needed by one or more members of the industry. Such service is still essential but more as a means to an end than as a prime function. It is my opinion that no trade association can serve its industry effectively if it does not maintain a statistical service. It is not sufficient to send out an occasional questionnaire to deal with a passing problem. It is absolutely necessary that the headquarters of the industry be furnished by its members currently and regularly data as to production, shipments, stocks, wages, and if possible, orders on hand. The reports of the individual plants are invariably treated as privileged or confidential. The association is concerned with the industry-wide data, not with the one-plant situation. The association must be able to watch the general trends of the industry for the purpose of putting up warning-signs or offering encouragement, as the case may be. The current composite reports which are sent under such a system to each contributing manufacturer permit the manufacturer to guide his production with increased wisdom.

The most important need for statistics is in the preparation of briefs and appearances of the industry before legislative and administrative bodies. An intelligent use of the accumulated records of a statistical service alone makes possible the preparation of a compelling and conclusive case on occasions such as I have just mentioned, and they place the representatives of the association in the position of being the best-informed persons on the facts of the industry and therefore the most influential in the discussions of proposals which will affect the industry.

Accumulated Industrial Experience Essential

The services rendered by a trade association are partly tangible and partly intangible. Of the former, some are direct, many are indirect. The intangible and the indirect are very frequently, if not usually, the more important. The preventive service of an association is usually of more consequence than many a positive accomplishment. The value which a manufacturer secures from his trade association depends upon the manufacturer himself. That company which examines all bulletins and informative matter transmitted by the association, seeking for values, finds values and extracts profits. My observation is that the larger corporations, and those which are headed in that direction, utilize their trade associations to the fullest degree, while those who question the value of the association or complain about its functioning are usually too busy to extract the value which is being transmitted to them constantly through bulletins, publications, etc., and who fail to attend conferences and participate in them to the fullest degree.

The association becomes the industry's repository of accumulated experience and fact. With this as a background, the association is ever-ready to serve the industry no matter what new problem may arise or what change may take place in its complexion. An industry may well hope that it will escape serious problems, but when such problems do arise it is relieving to know that its trade association is staffed and equipped to immediately tackle the problem and to dispose of it in the best way possible. This element of a trade association's value makes it a form of insurance. As in all insurance, the dues or the premiums must be paid with regularity if the insured or the beneficiary is to realize the face value of the policy in the event of damage or worse. When a company experiences a period of bad business there is one thing which it does not do as a result of this —it does not cancel the fire insurance carried on the plant, for that would be to merely add serious risks to the troubles already in hand. All that argues in favor of maintaining insurance in good standing argues just as strongly in favor of maintaining the trade association intact and unweakened, by extending to it regular support. It is smart business to belong to one's trade association and to extend it financial and moral support with regularity. The management of an association should not find it necessary to devote any considerable part of its time to trying

to make ends meet. That time could be invested to better advantage for the industry in the constructive activities of the association.

Trade Associations Must Plan for Industry

The time has already come, and this will be increasingly evident, for trade associations to become industry-planners and leaders, as well as industry-servers. This of course applies particularly to a national or industry-wide trade body. Those national trade associations, which are being recognized today as among the best, are those which have sensed the changed needs of industry and the larger duties as well as opportunities which stand squarely on their doorstep. Leadership and industry-wide planning is clearly the biggest need today in each and every industry. Leadership must be continuous, progressive, and based on accumulating fact and experience. These can only be assured through the national agency of the industry.

However, if the national trade association is logically the body which should be the planner and the leader of the industry in its industry-wide problems, it necessarily follows that the character and the performance of the association must measure up to the task. Leadership is a matter which can only be secured or earned by performance and which can only be retained so long as performance is high and adequate. To assure these, the policy-making body of the association, namely, its board of directors, should be a body to which only men of proven ability, character, and broad-minded leadership are elected. The day for political appointments or selections is over. To be sure, branches and sections of the industry must be recognized in the complexion of the board, but the measuring stick in selecting such representatives must be the qualities already referred to. A board so composed will at all times command the attention and the following of the industry as a whole.

The active full-time paid executive of a trade association today, whatever his title may be: president, managing director, or secretary, must be primarily an able experienced business executive. The larger and more important an industry, the truer this is. No longer is the executive position of an association a position in which to place a friend—it is a position in which to place the ablest man available to carry out the difficult task at hand. If a man of the character and ability requisite for the task occupies the position, certainly he must have a parity of voice in the counsels of the industry and he must be accorded opportunity to express his views frankly and freely. He cannot succeed in getting the necessary and worthwhile results if he is expected to, or attempts to avoid all mistakes and all disagreements. To perform under the prevailing tempo of our business and industrial life means to run the risk of error and of misunderstanding, because to hesitate or delay too long carries with it the alternative risk of failure.

I conclude by inviting the leaders of industry to give favorable consideration to the new concept of the functions, responsibilities and values of trade associations today, to lend them their adequate financial and complete moral support, and to fashion and find therein the vehicle of industry leadership which the changing conditions are crying for today. To myself and to those others who are engaged in directing the affairs of trade associations, I fling the challenging glove that we measure up to our opportunities and responsibilities, and that by our character, our performance and our judgment we command and retain the esteem of those whom we serve.

Vibrating Concrete Pavements Adds 10 Per Cent to Strength

VIBRATING the concrete in a pavement as it is laid increases the strength 10 per cent, according to a report by the Bureau of Public Roads of the U. S. Department of Agriculture or, by vibrating, 10 per cent less cement can be used, and the same strength maintained. Vibrators work on somewhat the same principle as those used in giving beauty treatments.

The report gives the results of an investigation recently conducted at Arlington, Virginia. Two hundred and seventy slabs of pavement, each 10 feet wide and 8 feet long, were constructed and tested. Four different types of vibrating equipment were used, their speeds varying from 3,600 to 4,000 revolutions per minute.

Slabs of similar composition were placed and finished by standard methods without vibration. Thus, differences in the strengths and physical properties were directly attributable to vibration. In every instance it was found that vibration increased the strength and density and decreased the amount of "honeycomb," or air pockets.

The report, published in the April, 1937, issue of *Public Roads*, describes ways in which existing specifications for pavement concrete can be modified to utilize vibration to advantage.

Executive Committee Selects White Sulphur Springs for Mid-Year Meeting of Board

THE Greenbrier, White Sulphur Springs, West Virginia, will be the scene of the mid-year meeting of the Board of Directors of the National Crushed Stone Association, in accord with action taken by the Executive Committee of the Association at its meeting held in Washington on May 6. Located amidst the scenic beauty of the Allegheny Mountains of West Virginia at an elevation of some 2,000 feet, White Sulphur is certain to prove a popular choice for the summer meeting. Mindful of the fact that many members of the Board desire to combine with the mid-year meeting a few days of relaxation and pleasure, the Committee scheduled the meeting for Thursday, June 17, leaving the week-end free for a full utilization of the excellent recreational facilities offered by this outstanding hostelry of the East. A large attendance is anticipated and members are urged to bring their wives. Also, any members of the Association who find it convenient to be in White Sulphur at the time of the meeting are most cordially invited to be present.

The Spring session of the Executive Committee was excellently attended, with the following members present:

H. E. Rodes, Franklin Limestone Co., Nashville, Tenn.
Otho M. Graves, General Crushed Stone Co., Easton, Pa.
E. J. Krause, Columbia Quarry Co., St. Louis, Mo.
Russell Rarey, Marble Cliff Quarries Co., Columbus, Ohio
Stirling Tomkins, New York Trap Rock Corp., New York City
T. I. Weston, Weston and Brooker Co., Columbia, S. C.
A. L. Worthen, New Haven Trap Rock Co., New Haven, Conn.

Others present were J. R. Boyd, A. T. Goldbeck, and M. S. Lambert, Chairman of the Manufacturers' Division, Robins Conveying Belt Co., Chicago, Ill.

Reports were received from the Engineering Director and the Administrative Director. Mr. Goldbeck discussed the results of certain investigations now being conducted in the Association's research laboratory which proved of intense interest to the members of the Committee and which will be made available to the membership upon completion of the investigation.

An analysis of the Association's financial affairs as of the end of the first third of the year indicated a stronger position than has been enjoyed for some years.

In discussing Referendum No. 71 of the U. S. Chamber of Commerce on whether or not the long and short haul clause of the Fourth Section of the Interstate Commerce Act should be eliminated, it was felt that, in view of the possible controversial nature of the subject, the Association should refrain from casting its vote on this referendum.

Authority was granted to issue in printed form the Manual of Uniform Cost Accounting Principles and Procedure for the Crushed Stone Industry which was developed by Ernst and Ernst under the auspices of the Code Authority. This work is now under way and the manual will be available for distribution in the near future.

After giving most thoughtful attention to the problem of labor relations in the crushed stone industry, the Committee concluded that the Association had best confine its activities in this field to making available to member companies pertinent information available from other sources. It is contemplated that further discussion of this general subject will constitute an important part of the agenda for the White Sulphur meeting.

The Committee also gave preliminary consideration to the selection of the time and place for the next annual convention, with final action on this matter to be determined at the forthcoming meeting of the Board of Directors.

Ballast Committee of American Railway Engineering Association Meeting

THE Committee on Ballast of the American Railway Engineering Association held its meeting in Washington on May 17. It will be of interest to crushed stone producers to know that the committee is taking steps to correlate service results of different kinds of railroad ballasts with the results of Los Angeles rattler tests on these different ballasts.

A. T. Goldbeck, Engineering Director of the National Crushed Stone Association, has been appointed Chairman of the sub-committee which will handle this project.

MANUFACTURERS' DIVISION

of the

NATIONAL CRUSHED STONE ASSOCIATION

These associate members are morally and financially aiding the Association in its efforts to protect and advance the interests of the crushed stone industry. Please give them favorable consideration whenever possible.

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